WHAT IS CLAIMED IS:

1. A method for fabricating a quantum dot infrared photodetector by using molecular beam epitaxy, comprising steps of:

a) growing a first gallium arsenide layer as a buffer layer on a gallium arsenide substrate;

b) growing a first undoped aluminum gallium arsenide layer as a blocking layer on said first gallium arsenide layer;

c) growing a quantum dot structure layer on said first undoped aluminum gallium arsenide layer at a specific temperature; and

d) growing a second gallium arsenide layer as a contact layer on said quantum dot structure layer.

2. The method according to claim 1, wherein said first gallium arsenide layer and said second gallium arsenide layer are n-type gallium arsenide layers.

3. The method according to claim 1, wherein said first gallium arsenide layer has a thickness about 1 μm.

4. The method according to claim 1, wherein said first undoped aluminum gallium arsenide layer has a thickness about 50 nm.

5. The method according to claim 1, wherein said specific temperature is ranged from 480℃ to 520℃.

6. The method according to claim 1, wherein said quantum dot structure layer is formed by multiple layers comprising n-type indium arsenide quantum dots buried in an undoped gallium arsenide barrier layer.

7. The method according to claim 6, wherein said undoped gallium arsenide barrier layer has a thickness about 30 nm.

8. The method according to claim 6, wherein said quantum dot structure layer is made of one of silicon/silicon germanium composite and indium gallium arsenide/gallium arsenide composite.

9. The method according to claim 6, wherein the number of said multiple layers is ranged from 3 to 100.

10. The method according to claim 1, between said step c) and said step d) said method further comprising a step of growing a second undoped aluminum gallium arsenide layer as a blocking layer.

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11. The method according to claim 11, wherein said second undoped aluminum gallium arsenide layer has a thickness of about 50 nm.

12. The method according to claim 11, wherein aluminum contents of said first aluminum gallium arsenide layer and said second aluminum gallium arsenide layer are ranged from 10% to 100% by weight, respectively.

13. The method according to claim 1, wherein said second gallium arsenide has a thickness of about 0.5 μm.

14. A method for fabricating a quantum dot infrared photodetector by using molecular beam epitaxy, comprising steps of:

a) growing a first gallium arsenide layer as a buffer layer on a gallium arsenide substrate;

b) growing a quantum dot structure layer on said gallium arsenide substrate at a specific temperature;

c) growing an undoped aluminum gallium arsenide layer as a blocking layer on said quantum dot structure layer; and

d) growing a second gallium arsenide layer as a contact layer on said undoped aluminum gallium arsenide layer.

15. A method for fabricating a quantum dot infrared photodetector by using molecular beam epitaxy, comprising steps of:

a) growing a first gallium arsenide layer as a buffer layer on a gallium arsenide substrate;

b) growing a first undoped aluminum gallium arsenide layer on said gallium arsenide substrate;

c) growing a quantum dot structure layer on said first undoped aluminum gallium arsenide layer at a specific temperature;

d) growing a second undoped aluminum gallium arsenide layer as a blocking layer on said quantum dot structure layer; and

e) growing a second gallium arsenide layer as a contact layer on said second undoped gallium arsenide layer.

16. A quantum dot infrared photodetector structure comprising:

a gallium arsenide substrate;

a first gallium arsenide layer as a first buffer layer formed on said gallium arsenide substrate;

a first undoped aluminum gallium arsenide layer as a blocking layer formed on said gallium arsenide layer;

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a quantum dot structure layer formed on said first undoped aluminum gallium arsenide layer;

a second undoped aluminum gallium arsenide layer as a second buffer layer formed on said quantum dot structure layer; and

a second gallium arsenide layer as a contact layer formed on said second undoped aluminum gallium arsenide.

17. The structure according to claim 16, wherein said first gallium arsenide layer and said second gallium arsenide layer are n-type gallium arsenide layers.

18. The structure according to claim 16, wherein said quantum dot structure layer is formed by multiple layers comprising indium arsenide quantum dots formed under an arsenic deficient condition and buried in an undoped gallium arsenide barrier layer.

19. The structure according to claim 18, wherein said quantum dot structure layer is made of one of silicon/silicon germanium composite and indium gallium arsenide/gallium arsenide composite.

20. The structure according to claim 18, wherein the number of said multiple layers is ranged from 3 to 100.

21. The structure according to claim 16, wherein aluminum contents of said first aluminum gallium arsenide layer and said second aliminum gallium arsenide layer are ranged from 10% to 100% by weight, respectively.

22. The structure according to claim 16, wherein said first gallium arsenide layer has a thickness of about 1 μm.